We claim:

1. A method for detecting an inflammatory response in a breast of a lactating mammal, which comprises measuring the presence or amount of a Serum Amyloid A (SAA) protein or mRNA encoding the protein, in a sample of milk obtained from the breast, the amount of the SAA protein or mRNA present in the sample being positively correlated with the inflammatory response.

2. The method of claim 1, wherein the mammal is the inflammatory response is mastitis.

3. The method of claim 2, wherein the mastitis is caused by infection with a microorganism.

4. The method of claim 2, wherein the inflammatory response is caused by a non-infective agent.

5. The method of claim 1, wherein the SAA comprises one or more inflammation-responsive isoforms of SAA.

6. The method of claim 5, wherein the SAA comprises an amino acid sequence selected from the group consisting of SEQ ID NOS:1-15.

7. The method of claim 1, which comprises measuring the amount of SAA protein in the milk sample.

8. The method of claim 7, wherein the amount of SAA protein is measured using an immunological assay with antibodies immunologically specific for one or more isoforms of SAA.

9. The method of claim 8, wherein the immunological assay is an ELISA assay.

10. The method of claim 1, which comprises measuring the amount of SAA mRNA in the milk sample.

11. The method of claim 10, wherein the amount of SAA mRNA is measured using a hybridization assay with nucleic acid molecules complementary to the SAA mRNA.

12. A diagnostic kit for screening milk samples to detect inflammation in breasts of lactating mammals, which comprises a container containing one or more antibodies immunologically specific for one or more SAA isoforms, and instructions for performing immunological assays of milk samples for SAA, using the antibodies.

13. The kit of claim 12, which further comprises at least one additional reagent for performing the immunological assays.

14. A diagnostic kit for screening milk samples to detect inflammation in breasts of lactating mammals, which comprises a container containing one or more nucleic acid molecules that specifically hybridizes to mRNA encoding or more SAA isoforms, and instructions for performing hybridization assays of milk samples for SAA, using the nucleic acids.

15. The kit of claim 14, which further comprises at least one additional reagent for performing the hybridization assays.

16. A method to assess the ability of a treatment or agent to increase or decrease inflammation in breast tissue, which comprises:

(a) obtaining a milk sample from a test subject to which the treatment or agent has been administered;

(b) obtaining a milk sample from a control subject which has not been administered the treatment or agent;

(c) measuring the amount of SAA in the test sample and the control sample; and

(d) comparing the measured amounts of SAA, an increase in SAA in the test sample as compared to the control sample indicating the ability of the treatment or agent to increase inflammation in the breast tissue, and a decrease in SAA in the test sample as compared to the control sample indicating the ability of the treatment or agent to decrease inflammation in the breast tissue.

17. The method of claim 16, adapted for screening a anti-microbial agents for treatment of mastitis.

18. A method of evaluating quality of a milk sample, which comprises:

(a) establishing a standard that correlates a pre-determined milk quality with a pre-determined concentration of SAA contained therein;

(b) measuring SAA concentration in the milk sample being tested for quality;

(c) comparing the amount of SAA in the milk sample with the established standard; and

(d) assigning a quality rating to the milk sample based on the comparison with the standard.

19. A method of determining the presence or amount of colostrum in a milk sample, which comprises:

(a) measuring SAA concentration in a milk test sample suspected of containing colostrum;

(b) comparing the amount of SAA in the test sample with an amount of SAA in a control milk sample known to contain no colostrum, an elevation in SAA in the test sample as compared with the control sample being indicative of the presence and amount of colostrum in the test sample.

20. The method of claim 19, which further comprises measuring a colostrum-specific isoform of SAA.

b) comparing the amount of SAA in the test sample with an amount of SAA in a control milk sample known to contain no colostrum, an elevation in SAA in the test sample as compared with the control sample being indicative of the presence and amount of colostrum in the test sample.

21. The method of claim 20, which further comprises measuring a colostrum-specific isoform of SAA.